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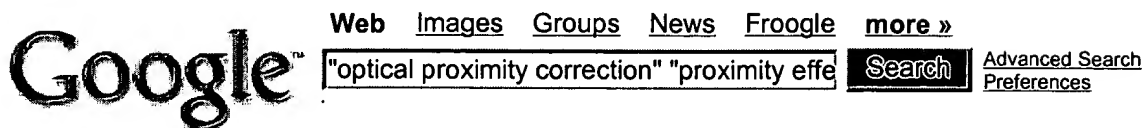
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... Technologies' **Optical Proximity Correction** (OPC) Services Introduction to OPC Techniques used to correct and analyze optical **proximity effects** are becoming ...

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... offers advanced approaches and techniques to implement **optical proximity correction** by adding ... services correct your device data for optical **proximity effects**. ...

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Future Fab Intl.

... this requires sophisticated application of **Optical Proximity Correction** (OPC) techniques to ... onto the wafer surface, so-called "**proximity effects**" can distort ...

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System and method for performing optical proximity correction on ...

... ensure that no **proximity effects** will occur between elements fully integrated in different cells. A one-dimensional **optical proximity correction** technique is ...

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... OPTISSIMO is able to restrict **optical proximity correction** to critical areas on ... proximity effect; simulation of optical **proximity effects** multiple illumination ...

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Optical Microlithography X

... Optical **proximity effects** correction at 0.25 μm incorporating process variations in ... **Optical proximity correction** of alternating phase-shift masks for 0.18- μm ...

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... Optical **proximity effects** occur when a chip has features that are smaller than the ...

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Relevance scale ☐ ☐ ☐ ☐ ☐**1** [A methodology for modeling the effects of systematic within-die interconnect and device variation on circuit performance](#)

Vikas Mehrotra, Shiou Lin Sam, Duane Boning, Anantha Chandrakasan, Rakesh Vallishayee, Sani Nassif

June 2000 **Proceedings of the 37th conference on Design automation**

Full text available: pdf(1.01 MB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

We present a methodology to study the impact of spatial pattern dependent variation on circuit performance and implement the technique in a CAD framework. We investigate the effects of interconnect CMP and poly CD device variation on interconnect delay and clock skew in both aluminum and copper interconnect technology. Our results indicate that interconnect CMP variation strongly affects interconnect delay, while poly CD variation has a large impact on clock skew in a 1 GHz design. Given th ...

2 [A pattern matching algorithm for verification and analysis of very large IC layouts](#)

Mariusz Niewczas, Wojciech Maly, Andrzej Strojwas

April 1998 **Proceedings of the 1998 international symposium on Physical design**

Full text available: pdf(922.02 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

We propose a simple, isometry invariant pattern matching algorithm for an effective data reduction useful in layout-related data processing of very complex IC designs. The repeatable geometrical features and attributes are stored in a pattern database. Original pattern instance, or its geometrical attributes, may be quickly regenerated based both on the information stored within the pattern and position of the pattern instance. We also show preliminary results of analysis of the state-of-th ...

3 [Session 7: Lithography and Routing: What's Next? \(invited\): Layout impact of resolution enhancement techniques: impediment or opportunity?](#)

Lars W. Liebmann

April 2003 **Proceedings of the 2003 international symposium on Physical design**

Full text available: pdf(374.96 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

This tutorial introduces the reader to the basic concepts of optical lithography, derives fundamental resolution limits, reviews the challenges facing future technology nodes, explains the principles of resolution enhancement techniques and their impact on chip layout, and discusses layout optimization considerations.

Keywords: design for manufacturability, lithography, radically restricted designs, resolution



enhancement techniques

4 Design for manufacturability in submicron domain



W. Maly, H. Heineken, J. Khare, P. K. Nag

January 1997 **Proceedings of the 1996 IEEE/ACM international conference on Computer-aided design**

Full text available: pdf(236.63 KB)



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Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Key characteristics of newly emerging IC technologies render the traditional concept of die size minimization and traditional "design rules" insufficient to handle the design-manufacturing interface. This tutorial surveys the design and process characteristics relevant to the manufacturability of submicron ICs. The discussion also covers analysis of design for manufacturability (DFM) trade-offs. Yield and cost models needed to analyze these trade-offs are explained as well.

Keywords: IC technologies, cost model, design for manufacturability, design rules, die size minimization, integrated circuit technology, submicron domain, trade-offs, yield

5 ASIC design in nanometer era - dead or alive?: Exploring regular fabrics to optimize the performance-cost trade-off



L. Pileggi, H. Schmit, A. J. Strojwas, P. Gopalakrishnan, V. Kheterpal, A. Koorapaty, C. Patel, V. Rovner, K. Y. Tong

June 2003 **Proceedings of the 40th conference on Design automation**

Full text available: pdf(319.99 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

While advances in semiconductor technologies have pushed achievable scale and performance to phenomenal limits for ICs, nanoscale physical realities dictate IC production based on what we can afford. We believe that IC design and manufacturing can be made more affordable, and reliable, by removing some design and implementation flexibility and enforcing new forms of design regularity. This paper discusses some of the trade-offs to consider for determination of how much regularity a particular IC ...

Keywords: cost, integrated circuits, performance, regularity

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Tsuneo Terasawa

January 2000 **Proceedings of the 2000 conference on Asia South Pacific design automation**

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Additional Information: [full citation](#), [references](#)

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1 Low energy e-beam proximity lithography (LEEPL)
Utsumi, T.;

Microprocesses and Nanotechnology Conference, 1999. Digest of Papers.

Microprocesses and Nanotechnology '99. 1999 International , 6-8 July 1999


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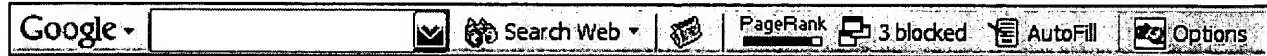
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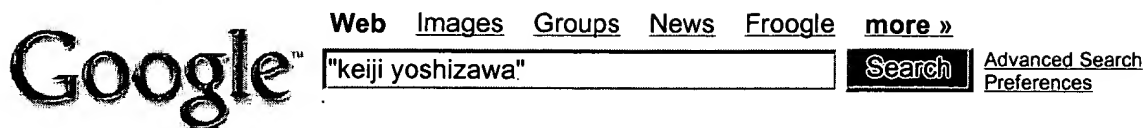
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1 Sub-1 /spl mu/m/sup 2/ high density embedded SRAM technologie 100 nm generation SOC and beyond

Tomita, K.; Hashimoto, K.; Inbe, T.; Oashi, T.; Tsukamoto, K.; Nishioka, Y.; Matsuura, M.; Eimori, T.; Inuishi, M.; Miyanaga, I.; Nakamura, M.; Kishimoto, Yamada, T.; Eriguchi, K.; Yuasa, H.; Satake, T.; Kajiya, A.; Ogura, M.; VLSI Technology, 2002. Digest of Technical Papers. 2002 Symposium on , 11-June 2002
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Vikas Mehrotra, Shiou Lin Sam, Duane Boning, Anantha Chandrakasan, Rakesh Vallishayee, Sani Nassif

 June 2000 **Proceedings of the 37th conference on Design automation**

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We present a methodology to study the impact of spatial pattern dependent variation on circuit performance and implement the technique in a CAD framework. We investigate the effects of interconnect CMP and poly CD device variation on interconnect delay and clock skew in both aluminum and copper interconnect technology. Our results indicate that interconnect CMP variation strongly affects interconnect delay, while poly CD variation has a large impact on clock skew in a 1 GHz design. Given th ...

2 [Session 7: Lithography and Routing: What's Next? \(invited\): Layout impact of resolution enhancement techniques: impediment or opportunity?](#)

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This tutorial introduces the reader to the basic concepts of optical lithography, derives fundamental resolution limits, reviews the challenges facing future technology nodes, explains the principles of resolution enhancement techniques and their impact on chip layout, and discusses layout optimization considerations.

Keywords: design for manufacturability, lithography, radically restricted designs, resolution enhancement techniques

3 [Automatic spelling correction in scientific and scholarly text](#)

Joseph J. Pollock, Antonio Zamora

 April 1984 **Communications of the ACM**, Volume 27 Issue 4
Full text available: pdf(901.06 KB) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

Keywords: dictionary lookup, similarity keys, spelling correction

4 A framework for realistic image synthesis

Donald P. Greenberg, Kenneth E. Torrance, Peter Shirley, James Arvo, Eric Lafortune, James A. Ferwerda, Bruce Walter, Ben Trumbore, Sumanta Pattanaik, Sing-Choong Foo
August 1997 **Proceedings of the 24th annual conference on Computer graphics and interactive techniques**

Full text available:  [pdf\(28.94 MB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

Keywords: light reflection, perception, realistic image synthesis

5 The office of the future: a unified approach to image-based modeling and spatially immersive displays

Ramesh Raskar, Greg Welch, Matt Cutts, Adam Lake, Lev Stesin, Henry Fuchs
July 1998 **Proceedings of the 25th annual conference on Computer graphics and interactive techniques**

Full text available:  [pdf\(2.00 MB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

Keywords: autocalibration, calibration, depth, display, image-based modeling, image-based rendering, intensity blending, projection, range, reflectance, spatially immersive display, virtual environments


6 Making faces

Brian Guenter, Cindy Grimm, Daniel Wood, Henrique Malvar, Fredric Pighin
July 1998 **Proceedings of the 25th annual conference on Computer graphics and interactive techniques**

Full text available:  [pdf\(1.70 MB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

7 Computer puppetry: An importance-based approach

Hyun Joon Shin, Jehee Lee, Sung Yong Shin, Michael Gleicher
April 2001 **ACM Transactions on Graphics (TOG)**, Volume 20 Issue 2

Full text available:  [pdf\(1.04 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Computer puppetry maps the movements of a performer to an animated character in real-time. In this article, we provide a comprehensive solution to the problem of transferring the observations of the motion capture sensors to an animated character whose size and proportion may be different from the performer's. Our goal is to map as many of the *important* aspects of the motion to the target character as possible, while meeting the online, real-time demands of computer puppetry. We adopt a K ...

Keywords: Human-figure animation, motion retargetting, performance-based animation, real-time animation

8 The power crust

Nina Amenta, Sunghee Choi, Ravi Krishna Kolluri

May 2001 **Proceedings of the sixth ACM symposium on Solid modeling and applications**

Full text available:  pdf(1.17 MB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

The *power crust* is a construction which takes a sample of points from the surface of a three-dimensional object and produces a surface mesh and an approximate medial axis. The approach is to first approximate the medial axis transform (MAT) of the object. We then use an inverse transform to produce the surface representation from the MAT.

This idea leads to a simple algorithm with theoretical guarantees comparable to those of other surface reconstruction and medial axis approxi ...

9 A pattern matching algorithm for verification and analysis of very large IC layouts

Mariusz Niewczas, Wojciech Maly, Andrzej Strojwas

April 1998 **Proceedings of the 1998 international symposium on Physical design**

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We propose a simple, isometry invariant pattern matching algorithm for an effective data reduction useful in layout-related data processing of very complex IC designs. The repeatable geometrical features and attributes are stored in a pattern database. Original pattern instance, or its geometrical attributes, may be quickly regenerated based both on the information stored within the pattern and position of the pattern instance. We also show preliminary results of analysis of the state-of-th ...

10 Emancipated pixels: real-world graphics in the luminous room

John Underkoffler, Brygg Ullmer, Hiroshi Ishii

July 1999 **Proceedings of the 26th annual conference on Computer graphics and interactive techniques**

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Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

Keywords: CAD, architectural space, computer vision, luminous-tangible interfaces, projection, real-world graphics

11 The digital Michelangelo project: 3D scanning of large statues

Marc Levoy, Kari Pulli, Brian Curless, Szymon Rusinkiewicz, David Koller, Lucas Pereira, Matt Ginzton, Sean Anderson, James Davis, Jeremy Ginsberg, Jonathan Shade, Duane Fulk

July 2000 **Proceedings of the 27th annual conference on Computer graphics and interactive techniques**

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We describe a hardware and software system for digitizing the shape and color of large fragile objects under non-laboratory conditions. Our system employs laser triangulation rangefinders, laser time-of-flight rangefinders, digital still cameras, and a suite of software for acquiring, aligning, merging, and viewing scanned data. As a demonstration of this system, we digitized 10 statues by Michelangelo, including the well-known figure of David, two building interiors, and all 1,163 extant f ...

Keywords: 3D scanning, cultural heritage, graphics systems, mesh generation, range images, rangefinding, reflectance and shading models, sensor fusion

12 An experimental laboratory for pattern recognition and signal processing

N. M. Herbst, P. M. Will

April 1972 **Communications of the ACM**, Volume 15 Issue 4Full text available:  pdf(2.02 MB)Additional Information: [full citation](#), [abstract](#), [references](#)

An interactive computer-controlled scanning and display system has been in operation at the IBM Thomas J. Watson Research Center for three years. The system includes two flying-spot scanners and a TV camera specially interfaced to a process control digital computer, dot-mode and vector displays, analog input and output facilities, and a variety of other experimental equipment. The system design and programming support are described and typical applications in scanner control, optical charac ...

Keywords: image processing, interactive terminal, pattern recognition, pseudorandom displays, scanners

13 Query evaluation techniques for large databases

Goetz Graefe

June 1993 **ACM Computing Surveys (CSUR)**, Volume 25 Issue 2Full text available:  pdf(9.37 MB)Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

Database management systems will continue to manage large data volumes. Thus, efficient algorithms for accessing and manipulating large sets and sequences will be required to provide acceptable performance. The advent of object-oriented and extensible database systems will not solve this problem. On the contrary, modern data models exacerbate the problem: In order to manipulate large sets of complex objects as efficiently as today's database systems manipulate simple records, query-processi ...

Keywords: complex query evaluation plans, dynamic query evaluation plans, extensible database systems, iterators, object-oriented database systems, operator model of parallelization, parallel algorithms, relational database systems, set-matching algorithms, sort-hash duality

14 Graphic applications subroutine packages

William L. Dunne

July 1968 **Proceedings of the 5th annual workshop on Design automation**Full text available:  pdf(1.28 MB)Additional Information: [full citation](#), [abstract](#), [index terms](#)

The Graphic Applications Subroutine Package, GASP, is a set of interdependent two-dimensional programs capable of producing drawings on an automatic digital plotter. GASP was justified and developed in an engineering support environment to satisfy certain requirements within the workload responsibilities of a production drafting room and within the engineering areas. In FORTRAN (G or H level) for the IBM System/360, the package utilizes plotter dependent routines through a simple standard i ...


15 Interactive Editing Systems: Part I

Norman Meyrowitz, Andries van Dam

September 1982 **ACM Computing Surveys (CSUR)**, Volume 14 Issue 3Full text available:  pdf(3.08 MB)Additional Information: [full citation](#), [citations](#), [index terms](#)**16 The Cricket location-support system**

Nissanka B. Priyantha, Anit Chakraborty, Hari Balakrishnan

August 2000 **Proceedings of the 6th annual international conference on Mobile computing and networking**

Full text available:  pdf(1.22 MB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#)

This paper presents the design, implementation, and evaluation of Cricket, a location-support system for in-building, mobile, location-dependent applications. It allows applications running on mobile and static nodes to learn their physical location by using listeners that hear and analyze information from beacons spread throughout the building. Cricket is the result of several design goals, including user privacy, decentralized administration ...

17 **PARO: supporting dynamic power controlled routing in wireless ad hoc networks**

Javier Gomez, Andrew T. Campbell, Mahmoud Naghshineh, Chatschik Bisdikian

September 2003 **Wireless Networks**, Volume 9 Issue 5

Full text available:  pdf(311.95 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)


This paper introduces PARO, a dynamic power controlled routing scheme that helps to minimize the transmission power needed to forward packets between wireless devices in ad hoc networks. Using PARO, one or more intermediate nodes called "redirectors" elects to forward packets on behalf of source-destination pairs thus reducing the aggregate transmission power consumed by wireless devices. PARO is applicable to a number of networking environments including wireless sensor networks, home networks ...

Keywords: ad hoc networks, power control, power optimization, routing protocols

18 **Filling and slotting: analysis and algorithms**

Andrew B. Kahng, Gabriel Robins, Anish Singh, Huijuan Wang, Alexander Zelikovsky

April 1998 **Proceedings of the 1998 international symposium on Physical design**

Full text available:  pdf(1.19 MB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

In very deep-submicron VLSI, certain manufacturing steps — notably optical exposure, resist development and etch, chemical vapor deposition and chemical-mechanical polishing (CMP) — have varying effects on device and interconnect features depending on local characteristics of the layout. To make these effects uniform and predictable, the layout itself must be made uniform with respect to certain density parameters. Traditionally, only foundries have performed the p ...

19 **Image-based motion blur for stop motion animation**

Gabriel J. Brostow, Irfan Essa

August 2001 **Proceedings of the 28th annual conference on Computer graphics and interactive techniques**

Full text available:  pdf(807.21 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Stop motion animation is a well-established technique where still pictures of static scenes are taken and then played at film speeds to show motion. A major limitation of this method appears when fast motions are desired; most motion appears to have sharp edges and there is no visible motion blur. Appearance of motion blur is a strong perceptual cue, which is automatically present in live-action films, and synthetically generated in animated sequences. In this paper, we present an approach fo ...

Keywords: animation, computer vision, image-based rendering, motion blur, stop motion animation, temporal antialiasing, video post-processing

20 Pen computing: a technology overview and a vision

André Meyer

July 1995 **ACM SIGCHI Bulletin**, Volume 27 Issue 3Full text available:  [pdf\(5.14 MB\)](#) Additional Information: [full citation](#), [abstract](#), [citations](#), [index terms](#)

This work gives an overview of a new technology that is attracting growing interest in public as well as in the computer industry itself. The visible difference from other technologies is in the use of a pen or pencil as the primary means of interaction between a user and a machine, picking up the familiar pen and paper interface metaphor. From this follows a set of consequences that will be analyzed and put into context with other emerging technologies and visions. Starting with a short historic ...

Results 1 - 20 of 41

Result page: [1](#) [2](#) [3](#) [next](#)

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